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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/853,614	05/14/2001	Shinichi Miyazaki	0229-0643P	6710

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EXAMINER	
FISCHER, JUSTIN R	

ART UNIT	PAPER NUMBER
1733	

DATE MAILED: 02/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

AS

Office Action Summary	Application No.	Applicant(s)	
	09/853,614	MIYAZAKI ET AL.	
	Examiner	Art Unit	
	Justin R Fischer	1733	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 January 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *8-15* is/are pending in the application.

4a) Of the above claim(s) *9-12,14 and 15* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *8 and 13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on January 30, 2004 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 8 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Masaki (US 5,894,875, newly cited) in view of Takahashi (JP 11-334313, of record) and optionally in view of Lommerts (US 5,194,210, newly cited). Masaki, Takahashi, and Lommerts are applied in the same manner as set forth in Paper Number 7, Paragraph 5.

Masaki, as best depicted in Figure 2, discloses a pneumatic tire construction comprising a carcass 4, a breaker 6, and a cap ply or band ply 7, wherein the carcass is formed of organic fiber cords, including polyester, and the breaker is formed of steel cords (Column 2, Line 60 – Column 3, Line 18). In describing the band ply, Masaki

suggests the preferred use of a high modulus organic fiber cord layer, such as polyester, aramid, rayon, and PEN, and notes that the particular material is not limited (Column 4, Lines 49-55). While Masaki fails to suggest the use of an aliphatic polyketone fiber cord, Takahashi (Paragraphs 9-12) discloses the use of aliphatic polyketone fiber cords in a variety of tire components and describes them as high modulus, lightweight, and economical in comparison to commonly used tire cord materials (e.g. steel, aramid). In particular, Takahashi teaches the use of such aliphatic polyketone fiber cords in an outermost cap or band ply since they provide the aforementioned benefits over existing tire cord materials. It is additionally noted that while Example 15 in Table 2 of Takahashi is the only example in which a cap or band ply formed of aliphatic polyketone fiber cords is included, this example results in the best high speed durability (fourth from bottom row in Table 2) and improved driving stability (second from bottom row in Table 2), which are the same benefits desired by the claimed invention (results of Table 1 on Page 9). Lommerts (Column 5, Lines 32-46) is optionally applied to further evidence the recognized use and benefits of aliphatic polyketone fiber cords in tires and particularly, the use of such cords in place of conventional cords, such as rayon, nylon, polyester, and aramid (all are disclosed as possible cap ply reinforcing materials in Masaki). As such, it would have been obvious to one of ordinary skill in the art at the time of the invention to form the cap ply or band ply of Masaki from aliphatic polyketone fiber cords, in view of Takahashi and optionally in view of Lommerts.

With respect to the properties of the aliphatic polyketone fiber cord, Table 2 of Takahashi describes several embodiments in which the aliphatic polyketone fiber cords are used in the belt structure. In these instances, the tensile strength is always greater than 10.2 g/d, the standard elongation is always less than 2.2 %, and the twist number or coefficient is 1,650. Furthermore, Takahashi suggests a range between 1,000 and 2,000 for the twist number or coefficient when used as a belt reinforcing element (Paragraph 47). While the reference fails to expressly describe the dry heat shrinkage as being less than or equal to 6.0%, one of ordinary skill in the art at the time of the invention would have expected this property to be present in the aliphatic fiber cords of Takahashi as it represents a material property and not a processing property, there being no evidence of any unique processing to obtain the claimed dry heat shrinkage. It is additionally noted that the aliphatic polyketone fiber cords of Takahashi are used in the same tire component (belt) and have a tensile strength, standard elongation, and twist number in accordance to the limitations of the claimed invention and as such, it is the examiner's position that the aliphatic polyketone fiber cords of Takahashi have a dry heat shrinkage that falls within the range of the claimed invention. Thus, Takahashi evidences that the claimed properties for the aliphatic polyketone fibers cords are consistent with those commonly associated with aliphatic polyketone fibers used in tires, particularly in the belt region.

Lastly, while Masaki suggests the use of other organic fiber cords for the carcass, in addition to polyester, the original disclosure fails to provide a conclusive showing of unexpected results to establish a criticality for the following tire design:

Carcass- Polyester, Breaker- Steel, Band Ply- Aliphatic Polyketone

The results of Table 1 suggest that the use of aliphatic polyketone fiber cords in a cap or band ply results in improved high speed durability, while optimizing tire weight and cost- they do not suggest that there is any criticality to the combination of a carcass formed of polyester and a breaker formed of steel. These results are not found to be persuasive since Takahashi specifically attributes the improvement in high speed durability to the inclusion of a cap ply formed of aliphatic polyketone fiber cords and further, Takahashi specifically states that aliphatic polyketone fiber cords provide the benefits of being lightweight and economical in comparison to existing tire materials. Also, Takahashi specifically recognizes that aliphatic fiber cords provide improvements in fatigue resistance and cost as compared to aramid fiber cords, which is analogous to that disclosed by the claimed invention (Page 1, 3rd Paragraph). Additionally, Lommerts is optionally applied to further evidence the recognized use of such aliphatic polyketone fiber cords in tires in place of conventional materials, such as rayon, nylon, polyester, and aramid, all of which are suggested as possible reinforcing materials by Masaki. Thus, one of ordinary skill in the art at the time of the invention would have been motivated to form the cap or band ply of Masaki from aliphatic polyketone fiber cords since they provide excellent modulus characteristics while reducing tire weight and cost in comparison to existing tire materials and further provide improved high speed durability, which is similarly desired by the claimed invention.

Response to Arguments

4. Applicant's arguments filed January 30, 2004 have been fully considered but they are not persuasive. Applicant contends that Takahashi fails to suggest the use of an aliphatic polyketone fiber in a band ply in the manner claimed by applicants and furthermore, taking Takahashi's preferred teachings into account, one would be motivated to modify the carcass of Masaki as opposed to the band ply. Applicant further argues that there is no motivation to use aliphatic polyketone fiber in Masaki. Lastly, applicant contends that the comparative data of the claimed invention suggests the benefits of aliphatic polyketone fiber cords.

It is initially noted that Masaki fails to place any criticality on the cord material of the outermost cap ply. In fact, Masaki specifically states, "the organic fiber cord of the cap ply is not limited" (Column 4, Lines 49-59). Masaki goes on to describe the use of organic materials having relatively low elasticity, such as nylon, and organic materials having relatively high elasticity, such polyester and aramid. Thus, the reference only desires a suitable organic fiber cord material for the outermost cap ply. Takahashi describes the use of aliphatic polyketone fiber cords in the tire carcass and/or belt layer. In particular, Example 15 of Table 2 in Takahashi includes an outermost cap ply (belt layer) formed of aliphatic polyketone fiber cords, wherein this tire construction resulted in the best high-speed durability and improved driving stability as compared to the additional examples. Thus, Takahashi recognizes that aliphatic polyketone fiber is a suitable and desirable material for an outermost cap ply and in view of Masaki's general teaching of using an organic fiber cord, one of ordinary skill in the art at the time of the

invention would have found it obvious to form the cap ply of Masaki from aliphatic polyketone fiber cords. It is emphasized that Takahashi (Paragraphs 9-12) describes aliphatic polyketone fiber cords as high modulus, lightweight, and economical in comparison to commonly used tire cord materials (e.g. steel, aramid). Additionally, Lommerts has been optionally applied to further evidence the recognized use of aliphatic polyketone fiber cords in tires, particularly in place of conventional materials such as rayon, nylon, polyester, and aramid, all of which are suggested by Masaki.

As to the "lack of motivation" argument presented by applicant, it is evident from the previous paragraph that both Takahashi and Lommerts recognize the beneficial use of aliphatic polyketone fiber cords in tires and Takahashi more specifically in the carcass and belt layers (including cap layers). As to the use of an organic fiber cord with an elasticity (modulus of elasticity) greater than 800 kg/mm^2, Masaki is directed to the use of materials having both low and high elastic properties. While a preferred range might be greater than 800 kg/mm^2, this recitation does not exclude the use of additional materials having elasticity below 800 kg/mm^2, especially since Masaki expressly states, "the organic fiber cord of the cap ply is not particularly limited, but can be an organic fiber cord with a low elasticity....". Lastly, as evidenced by Lommerts (Column 6, Lines 50-60), aliphatic fiber cords used in tires are desired to have an initial modulus of at least 35 N/tex, which is equivalent to approximately 5,000 kg/mm^2. One of ordinary skill in the art at the time of the invention would expect such an aliphatic fiber cord to exhibit a modulus of elasticity of at least 800 kg/mm^2.

With respect to the comparative data of the claimed invention, the examiner's position has been set forth at the end of Paragraph 3 above.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Justin R Fischer** whose telephone number is **(571) 272-1215**. The examiner can normally be reached on M-F (7:30-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (571) 272-1226. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Justin Fischer

February 18, 2004

JEFF H. AFTERGUT
PRIMARY EXAMINER
GROUP 1300